

Mathieu Pellen

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Date and place of birth: 4th of June 1987 in Brest, France
Nationality, Gender, Status: French, Male, Single
Languages: French (native), English (fluent), German (fluent)
Computing: FORTRAN, C + +, Python, Mathematica, Matlab, Form

Research

- 10/18 - present Research Associate position
Cavendish laboratory,
University of Cambridge (United Kingdom)
- 10/15 - 09/18 Postdoctoral position
Institute for Theoretical Physics und Astrophysics,
Würzburg University (Germany)
- 10/11 - 09/15 PhD thesis
Precision Calculations for Physics Beyond the Standard Model,
Supervisor: Michael Krämer - RWTH Aachen (Germany)
- 03 - 08/2011 Master thesis
*Examination of energy and momentum conservation rules for the inter-
section of branes*
Supervisor: David Wands - ICG / Portsmouth (United Kingdom)
- 06 - 08/2010 Bachelor thesis
Modelling proton-proton collisions at the LHC
Supervisor: Arthur Moraes - University of Glasgow (United Kingdom)
- 07 - 08/2009 Summer project
Calculations for Coupling of a SQUID with a coplanar resonant line
Supervisor: Olivier Buisson - Institut Néel (CNRS) / Grenoble (France)

Education

- 10/11 - 06/15 PhD study
Institute for Theoretical Particle Physics and Cosmology,
RWTH Aachen University (Germany)
- 09/10 - 09/11 International Master in Subatomic and Astroparticle Physics
Joseph Fourier University / LPSC - Grenoble (France)
- 09/08 - 09/11 Master degree in Physics and Nanoscience
Grenoble Institute of Technology (France)
- 09/05 - 09/08 Classe préparatoire aux Grandes écoles (equivalent to first and second year of university)
Lycée de Kérichen, Brest (France)

Publications / Proceedings

- [1] J. R. Andersen *et. al.*, *Les Houches 2017: Physics at TeV Colliders Standard Model Working Group Report*, in *10th Les Houches Workshop on Physics at TeV Colliders (PhysTeV 2017) Les Houches, France, June 5-23, 2017*, 2018. 1803.07977.
- [2] A. Ballestrero *et. al.*, *Precise predictions for same-sign W-boson scattering at the LHC*, *Eur. Phys. J. C* **78** (2018), no. 8 671 [1803.07943].
- [3] C. F. Anders *et. al.*, *VBSCan Split 2017 Workshop Summary*, 2018. 1801.04203.
- [4] A. Denner and M. Pellen, *Off-shell production of top-antitop pairs in the lepton+jets channel at NLO QCD, submitted to JHEP (2017)* [1711.10359].
- [5] A. Denner, J.-N. Lang, M. Pellen and S. Uccirati, *NLO QCD and EW corrections to processes involving off-shell top quarks*, in *13th International Symposium on Radiative Corrections: Application of Quantum Field Theory to Phenomenology (RADCOR 2017) St. Gilgen, Austria, September 24-29, 2017*, 2017. 1711.08910.
- [6] B. Biedermann, A. Denner and M. Pellen, *Electroweak corrections to vector-boson scattering*, in *13th International Symposium on Radiative Corrections: Application of Quantum Field Theory to Phenomenology (RADCOR 2017) St. Gilgen, Austria, September 24-29, 2017*, 2017. 1711.02932.
- [7] M. Pellen, *Automated computations of electroweak corrections using Sherpa+Recola*, in *29th Rencontres de Blois on Particle Physics and Cosmology Blois, France, May 28-June 2, 2017*, 2017. 1709.05791.
- [8] B. Biedermann, A. Denner and M. Pellen, *NLO electroweak corrections to vector-boson scattering at the LHC*, in *25th International Workshop on Deep Inelastic Scattering and Related Topics (DIS 2017) Birmingham, UK, April 3-7, 2017*, 2017. 1708.00646.

- [9] B. Biedermann, A. Denner and M. Pellen, *Complete NLO corrections to W^+W^+ scattering and its irreducible background at the LHC*, *JHEP* **10** (2017) 124 [1708.00268].
- [10] B. Biedermann, S. Bräuer, A. Denner, M. Pellen, S. Schumann and J. M. Thompson, *Automation of NLO QCD and EW corrections with Sherpa and Recola*, *Eur. Phys. J.* **C77** (2017) 492 [1704.05783].
- [11] A. Denner, J.-N. Lang, M. Pellen and S. Uccirati, *Higgs production in association with off-shell top-antitop pairs at NLO EW and QCD at the LHC*, *JHEP* **02** (2017) 053 [1612.07138].
- [12] L. Ali Cavazonza, H. Gast, M. Krämer, M. Pellen and S. Schael, *Constraints on leptophilic dark matter from the AMS-02 experiment*, *Astrophys. J.* **839** (2017), no. 1 36 [1612.06634].
- [13] B. Biedermann, A. Denner and M. Pellen, *Large electroweak corrections to vector-boson scattering at the Large Hadron Collider*, *Phys. Rev. Lett.* **118** (2017), no. 26 261801 [1611.02951].
- [14] A. Denner and M. Pellen, *NLO electroweak corrections to off-shell top-antitop production with leptonic decays at the LHC*, *JHEP* **08** (2016) 155 [1607.05571].
- [15] C. Arina, M. Backović, E. Conte, B. Fuks, J. Guo, J. Heisig, B. Hespel, M. Krämer, F. Maltoni, A. Martini, K. Mawatari, M. Pellen and E. Vryonidou, *A comprehensive approach to dark matter studies: exploration of simplified top-philic models*, *JHEP* **11** (2016) 111 [1605.09242].
- [16] L. Ali Cavazonza, M. Krämer and M. Pellen, *Exploring Dark Matter with AMS-02 through Electroweak Corrections*, in *Proceedings, 11th Patras Workshop on Axions, WIMPs and WISPs (Axion-WIMP 2015): Zaragoza, Spain, June 22-26, 2015*, pp. 96–99, 2015.
- [17] J. Heisig and M. Pellen, *Dark Matter at the LHC and IceCube - a Simplified Model Interpretation*, in *Proceedings, 11th Patras Workshop on Axions, WIMPs and WISPs (Axion-WIMP 2015): Zaragoza, Spain, June 22-26, 2015*, pp. 130–133, 2015. 1509.08640.
- [18] J. Heisig, M. Krämer, M. Pellen and C. Wiebusch, *Constraints on Majorana Dark Matter from the LHC and IceCube*, *Phys. Rev.* **D93** (2016), no. 5 055029 [1509.07867].
- [19] M. Backović, M. Krämer, F. Maltoni, A. Martini, K. Mawatari and M. Pellen, *Higher-order QCD predictions for dark matter production at the LHC in simplified models with s-channel mediators*, *Eur. Phys. J.* **C75** (2015), no. 10 482 [1508.05327].

- [20] L. Ali Cavazonza, M. Krämer and M. Pellen, *Electroweak fragmentation functions for dark matter annihilation*, *JCAP* **1502** (2015), no. 02 021 [1409.8226].
- [21] R. Gavin, C. Hangst, M. Krämer, M. Mühlleitner, M. Pellen, E. Popena and M. Spira, *Squark Production and Decay at NLO matched with Parton Showers*, *PoS DIS2014* (2014) 125.
- [22] R. Gavin, C. Hangst, M. Krämer, M. Mühlleitner, M. Pellen, E. Popena and M. Spira, *Squark Production and Decay matched with Parton Showers at NLO*, *Eur. Phys. J.* **C75** (2015), no. 1 29 [1407.7971].
- [23] L. Ali Cavazonza, M. Krämer and M. Pellen, *Electroweak fragmentation functions for dark matter annihilation*, in *Proceedings, 10th Patras Workshop on Axions, WIMPs and WISPs (AXION-WIMP 2014): Geneva, Switzerland, June 29-July 4, 2014*, pp. 33–36, 2014.
- [24] M. Pellen, *Conservation laws for colliding branes with induced gravity*, *Astrophys. Space Sci.* **357** (2015), no. 1 24 [1309.6750].
- [25] R. Gavin, C. Hangst, M. Krämer, M. Mühlleitner, M. Pellen, E. Popena and M. Spira, *Matching Squark Pair Production at NLO with Parton Showers*, *JHEP* **10** (2013) 187 [1305.4061].

Teaching - Supervision

- 04/2018 Lectures on “Introduction to electroweak corrections”
“First EWSB spring school” - Maratea, Italy
- 2017-18 Teaching assistant *Advanced Quantum Field Theory*
- 2015 Teaching assistant *Classical Mechanics*
- 2014 Teaching assistant *Quantum Mechanics*
- 2013 Supervision of students for bachelor thesis:
 - *Supersymmetric quantum mechanics*
 - *Two Higgs doublet model*
- 2012-13 Teaching assistant *Classical Electrodynamics*
- 2012 Supervision of master students for literature seminar:
 - *Extra dimension models*

Administrative responsibilities - Referee

- 2019-... Organisation of weekly seminar (University of Cambridge)
- 2017-... Referee for JHEP
- 2017-... Convener of theory working group - VBSCAN COST action
- 2017-18 Representative for the Germany in the VBSCAN COST action
- 2016-18 Organisation of weekly institute seminar (University Würzburg)

Referees

- **Ansgar Denner**

Institute for Theoretical Physics und Astrophysics,
Würzburg University, 97074 Würzburg, Germany,
denner@physik.uni-wuerzburg.de,
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- **Margarete Muehleitner**

Institute for Theoretical Physics ,
Karlsruhe Institute of Technology,
Wolfgang-Gaede-Str. 1, 76131 Karlsruhe, Germany,
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- **Michael Krämer**

Institute for Theoretical Particle Physics and Cosmology,
RWTH Aachen University, 52056 Aachen, Germany,
mkraemer@physik.rwth-aachen.de,
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- **David Wands**

Institute of Cosmology and Gravitation,
University of Portsmouth,
Burnaby Road, Portsmouth PO1 3FX, United Kingdom
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+44 2392 843115

Presentations

- 10/2018 *Vector-boson scattering at the LHC*,
Seminar, University of Cambridge (United Kingdom) - **invited**.
- 09/2018 *Production of top quark pairs at the LHC: NLO corrections and off-shell effects*,
Seminar, University of Zurich (Switzerland) - **invited**.
- 08/2018 *Theory input for VBS*,
QCD@LHC, Dresden (Germany) - **invited**.
- 07/2018 *Top quark at the LHC: NLO corrections and off-shell effects*,
Seminar, Desy Hamburg (Germany) - **invited**.
- 04/2018 *Theory developments in VBS simulations*,
SM@LHC, Berlin (Germany) - **invited**.
- 03/2018 *Vector-boson scattering at the LHC*,
Seminar, University of Cambridge (UK) - **invited**.
- 02/2018 *High precision description of VBS at the LHC*,
CMS meeting, CERN (Switzerland) - **invited**.
- 01/2018 *NLO corrections for processes involving off-shell top quarks*,
Seminar, Freiburg (Germany) - **invited**.
- 11/2017 *EW, QCD, and interference contributions for VBS*,
Workshop “Monte-Carlo description of VBS”, Nikhef (Netherlands).
- 09/2017 *NLO QCD and EW corrections for processes involving off-shell top quarks*,
RADCOR 2017, St Gilgen (Austria).
- 08/2017 *Status of EW NLO corrections for multi-boson processes*,
MBI 2017, KIT / Karlsruhe (Germany) - **invited**.
- 06/2017 *Complete NLO corrections to $pp \rightarrow \mu_+\nu_\mu e_+\nu_e jj$* ,
VBSCAN meeting, Split (Croatia).
- 06/2017 *EW corrections: Recola, Automation, VBS*,
Les Houches workshop, Les Houches (France).
- 05/2017 *Automatised computations of EW corrections using Sherpa+Recola*,
Rencontres de Blois 2017, Blois (France) - **invited**.
- 05/2017 *NLO EW corrections for processes involving off-shell top quarks*,
Seminar, Göttingen University (Germany) - **invited**.
- 04/2017 *Higgs production in association with off-shell top-antitop pairs at NLO EW and QCD*,
CMS generator meeting, CERN - Geneva, (Switzerland) - **invited**.
- 04/2017 *Large electroweak corrections to vector-boson scattering at the LHC*,
DIS 2017 - Birmingham University (United Kingdom).

- 03/2017 *Higgs production in association with off-shell top-antitop pairs at NLO EW and QCD,*
DPG Meeting - Münster University (Germany).
- 03/2017 *NLO electroweak corrections to off-shell top-antitop production with leptonic decays at the LHC,*
DPG Meeting - Münster University (Germany) - **invited.**
- 08/2016 *NLO EW corrections to off-shell top quark pair production,*
QCD@LHC 2016 - Zurich (Switzerland).
- 12/2015 *Simplified models in Madgraph,*
LHC Dark Matter WG meeting - CERN - Geneva (Switzerland).
- 11/2015 *Precise predictions for Dark Matter production at the LHC,*
Helmholtz Alliance meeting “Physics at the Terascale” - Hamburg Desy (Germany).
- 10/2015 *Higher-order NLO-QCD predictions for dark matter production at the LHC,*
New Physics meeting - Bonn (Germany).
- 10/2015 *NLO predictions for Dark Matter production at the LHC,*
HAP meeting - Karlsruhe (Germany).
- 06/2015 *Exploring Dark Matter with AMS-02 through Electroweak Corrections,*
Patras Workshop - Zaragoza (Spain).
- 03/2015 *NLO accuracy and spin effects for squark-gluino production and decay,*
DPG Meeting - Wuppertal (Germany).
- 01/2015 *NLO accuracy for Supersymmetric processes at the LHC,*
Seminar - Würzburg University (Germany) - **invited.**
- 12/2014 *Supersymmetry: from the algebra to LHC phenomenology,*
Seminar - RWTH Aachen (Germany).
- 10/2014 *NLO accuracy for production and decay of squarks matched with parton shower,*
Theory meeting - BCTP Bonn (Germany).
- 09/2014 *NLO accuracy for production and decay of squarks matched with parton shower,*
Desy Theory Workshop - Desy Hamburg (Germany).
- 07/2014 *Next to leading order accuracy for production and decay of squarks and gluino,*
SUSY 2014 - University of Manchester (United Kingdom).
- 03/2014 *Next to leading order accuracy for production and decay of squarks and gluino,*
DPG Meeting - Mainz University (Germany).
- 03/2013 *Basics of AdS / CFT correspondence,*
Seminar - Department of Mathematics - University of Brest (France) - **invited.**
- 03/2013 *Supersymmetric Cascade Decays at Next-to-Leading Order: Squark decay,*
DPG Meeting - TU Dresden (Germany).

- 02/2013 *Instanton and Strong CP problem*,
Literature Seminar - RWTH Aachen (Germany).
- 08/2012 *Supersymmetric Cascade Decays at Next-to-Leading Order*,
GK Berichtswocbe - Vaals (Netherlands).
- 05/2012 *Strong vs. Weak Electroweak symmetry breaking (AdS / CFT)*,
Literature Seminar, RWTH Aachen (Germany).
- 08/2011 *Rules for colliding branes in higher-dimensions*,
Seminar, ICG-Portsmouth (United Kingdom).
- 08/2010 *Modelling proton-proton collisions at the LHC*,
Seminar, University of Glasgow (Scotland).

Posters

- 10/2016 *NLO electroweak corrections to off-shell top-antitop production with leptonic decays at the LHC*, 625. WE-Heraeus-Seminar - Bad Honnef (Germany).
- 08/2015 *Higher-order QCD predictions for dark matter production in simplified models*,
9th MCnet School - Spa (Belgium).
- 11/2014 *NLO accuracy for the production and decay of squarks and gluino*, 573. WE-Heraeus-Seminar - Bad Honnef (Germany).
- 08/2012 *Supersymmetric Cascade Decays at Next-to-Leading Order*, 40th SLAC Summer Institute, SLAC-Stanford (USA).

Scientific Schools

- 08/2015 9th MCnet School. Spa (Belgium).
- 09/2012 DPG School, "Heavy particles at the LHC". Bad Honnef (Germany).
- 07/2012 40th SLAC Summer Institute, "The Electroweak Scale". SLAC-Stanford (USA).
- 07/2011 Intensive course - Topics in Gravitation and Cosmology by Christian Boehmer. UCL-London (United Kingdom).

Conferences / Workshop

- 08/2018 QCD@LHC. Dresden (Germany).
- 06/2018 VBSCAN meeting. Thessaloniki (Greece).
- 04/2018 SM@LHC. Berlin (Germany).
- 02/2018 VBSCAN meeting. CERN (Switzerland).
- 09/2017 RADCOR 2017. St Gilgen (Austria).
- 08/2017 MBI 2017. KIT Karlsruhe (Germany)
- 06/2017 VBSCAN meeting. Split (Croatia).
- 10/2017 Les Houches workshop. Les Houches (France).
- 05/2017 Rencontres de Blois 2017. Blois (France)
- 04/2017 DIS 2017. Birmingham University (United Kingdom).
- 03/2017 DPG Meeting. Münster University (Germany).
- 10/2016 625. WE-Heraeus-Seminar: “interplay between precision measurements and searches for new physics”. Bad Honnef (Germany).
- 08/2016 QCD@LHC 2016. Zurich (Switzerland).
- 11/2015 Helmholtz Alliance meeting “Physics at the Terascale”. Desy Hamburg (Germany).
- 10/2015 HAP Dark Matter 2015. KIT Karlsruhe (Germany).
- 03/2015 Topical wokshop. “Anticipating 14 TeV: Insights into Matter from the LHC and Beyond”. Munich Insitute for Astro- and Particle Physcs (Germany).
- 03/2015 11th Patras Workshop on Axions, WIMPs and WISPs. Zaragoza University (Spain).
- 03/2015 Topical wokshop. “Effective theories and dark matter”. Mainz Institute for Theoretical Physics (Germany).
- 03/2015 79th Annual Meeting of the DPG. Wuppertal University (Germany).
- 10/2014 573. WE-Heraeus-Seminar: “Physics Landscape after the Higgs Discovery at the LHC”. Bad Honnef (Germany).
- 09/2014 Desy Theory Workshop. Desy Hamburg (Germany).
- 09/2014 Closing meeting Meeting of the SFB/TR 9. Durbach (Germany).
- 07/2014 SUSY 2014. University of Manchester (United Kingdom).
- 03/2014 78th Annual Meeting of the DPG. Mainz University (Germany).
- 10/2013 20th Meeting of the SFB/TR 9 - Computational Particle Physics. KIT-Karlsruhe (Germany).
- 09/2013 LHC run 1 aftermath - “where theory meets experiment”. Bad Honnef (Germany).

- 03/2013 19th Meeting of the SFB/TR 9 - Computational Particle Physics. RWTH Aachen (Germany).
- 03/2013 77th Annual Meeting of the DPG. TU Dresden (Germany).
- 10/2012 Strings, Cosmology and Gravity Student Conference 2012. IHP Paris (France).
- 10/2012 18th Meeting of the SFB/TR 9 - Computational Particle Physics. HU Berlin (Germany).
- 03/2012 17th Meeting of the SFB/TR 9 - Computational Particle Physics. KIT Karlsruhe (Germany).
- 11/2011 16th Meeting of the SFB/TR 9 - Computational Particle Physics. RWTH Aachen (Germany).
- 09/2011 Workshop on Theoretical Cosmology. ICG-Portsmouth (United Kingdom).
- 09/2011 Cosmic (Super)Strings Meeting / UK Particle Cosmology meeting. ICG Portsmouth (United Kingdom).
- 07/2011 The Dark Energy Survey Spring Collaboration Meeting 2011. ICG Portsmouth (United Kingdom).
- 05/2011 UK Particle Cosmology meeting. DAMTP Cambridge (United Kingdom).